WHAT IS CLAIMED IS:

1. A Maximum Time Interval Error (MTIE) test signal generating apparatus in which a signal obtained by modulating a clock signal from a reference clock generator in terms of phase by means of a predetermined MTIE test signal is input to a maximum time interval error (MTIE) measuring unit including a low-pass measuring filter having a predetermined high-cut characteristic at an input portion thereof so as to generate the predetermined MTIE test signal which enables measurement of a predetermined MTIE characteristic based on the signal, comprising:

a cycle-amplitude setting portion which sets a cycle corresponding to an observation time of each of desired plural specific points for a predetermined MTIE characteristic of plural MTIE characteristics and an amplitude corresponding to a difference in the MTIE value between adjacent specific points of the desired plural specific points;

plural signal generating portions which generate plural signals each having a cycle corresponding to an observation time of each of the desired plural specific points and an amplitude corresponding to a difference in MTIE value between adjacent specific points of the desired plural specific points, the cycle and amplitude being set by the cycle-amplitude setting portion and having repetitive waveforms in which after the signal amplitude increases from its lower limit value to its upper limit value during each observation time, it decreases from the upper limit value to the lower limit value and then outputting to each of the desired plural specific points;

a holding time setting portion which sets a holding time for holding the upper limit value and the lower limit value of the repetitive waveform of the signal over the predetermined time so that at least a signal cycle having the shortest cycle of the plural signals generated by the plural signal generating portions is longer than a predetermined time corresponding to the predetermined high-cut characteristic of the low-pass measuring filter in the MTIE measuring unit; and

a synthesizing portion which synthesizes the plural signals output from the plural signal generating portions by summing and outputting as the predetermined MTIE test signal.

2. An MTIE test signal generating apparatus according to claim 1, further comprising a characteristic specifying portion which specifies the predetermined MTIE characteristic of the plural MTIE characteristics to the cycle-amplitude setting portion.

3. An MTIE test signal generating apparatus according to claim 1, wherein the holding time setting portion sets the repetitive waveform of a signal at

least having the shortest cycle in the plural signal generating portions to such a waveform in which after the signal amplitude increases monotonously from its lower limit value to its upper limit value, the upper limit value is maintained over a predetermined time and then after the signal amplitude decreases from the upper limit value to the lower limit value during the observation time after the holding time elapses, the lower limit value is maintained over the predetermined time.

4. An MTIE test signal generating apparatus according to claim 1, wherein the holding time setting portion is provided as a fixed holding time setting portion which sets the holding time to a fixed value over the predetermined time in a signal generating portion for generating a signal having at least the shortest cycle of the plural signal generating portions.

5. An MTIE test signal generating apparatus according to claim 1, wherein the holding time setting portion has a function for setting the holding time in a signal generating portion having at least the shortest cycle of the plural signal generating portions to any value over the predetermined time.

6. An MTIE test signal generating apparatus according to claim 1, wherein the holding time setting portion has a function for setting the holding time in

a signal generating portion for generating a signal having at least the shortest cycle of the plural signal generating portions corresponding to a cycle set by the cycle-amplitude setting portion.

7. An MTIE test signal generating apparatus according to claim 1, further comprising a high-cut frequency setting portion which, if a high-cut frequency for specifying the predetermined high-cut characteristic of the low-pass measuring filter in the MTIE measuring unit is changed, sets a high-cut frequency corresponding to the changed high-cut frequency wherein the holding time setting portion sets the holding time corresponding to a high-cut frequency set by the high-cut frequency setting portion in a signal generating portion for generating at least the shortest cycle of the plural signal generating portions.

8. An MTIE test signal generating apparatus according to claim 1, wherein the plural signal generating portions generate plural signals having substantially sine wave like trapezoidal waveform or substantially linear trapezoidal repetitive waveforms.

9. An MTIE test signal generating apparatus according to claim 1, wherein the cycle-amplitude setting portion, the plural signal generating portions, the holding time setting portion and the synthesizing portion are constituted of a digital signal processor

and the predetermined MTIE test signal is created and output by the digital signal processor.

10. An MTIE test signal generating apparatus according to claim 9, wherein as a phase modulator for modulating the clock signal from the reference clock generator in terms of phase with the predetermined MTIE test signal created and output by the digital signal processor, a direct digital synthesizer is employed.

11. A Maximum Time Interval Error (MTIE) test signal generating apparatus in which a signal obtained by modulating a clock signal from a reference clock generator in terms of phase by means of a predetermined MTIE test signal is input to a maximum time interval error (MTIE) measuring unit including a low-pass filter having a predetermined high-cut characteristic at an input portion thereof so as to generate the predetermined MTIE test signal which enables measurement of a predetermined MTIE characteristic based on the signal, comprising:

a cycle-amplitude information setting portion which sets cycle information corresponding to an observation time of each of desired plural specific points about a desired MTIE characteristic of plural MTIE characteristics and amplitude information corresponding to a difference in MTIE value between adjacent specific points of the desired plural specific points;

plural signal waveform information generating portions which generates waveform information about plural signals having such a repetitive waveform in which after a signal amplitude increases form its lower limit value to its upper limit value during the each observation time, the signal amplitude decreases from the upper limit value to the lower limit value, based on cycle information corresponding to an observation time of each of the desired plural specific points set by the cycle-amplitude information setting portion and amplitude information corresponding to a difference in MTIE value between adjacent specific points of the desired plural specific points and outputs to each of the desired plural specific points;

a holding time information setting portion which sets holding time information for holding the upper limit value and the lower limit value of the signal repetitive waveform for over the predetermined time so that the cycle of a signal having at least the shortest cycle in waveform information of the plural signals generated from the plural signal waveform information generating portions is longer than a predetermined time corresponding to the predetermined high-cut characteristic of the low-pass measuring filter in the MTIE measuring unit; and

a waveform information synthesizing portion which synthesizes the plural signal waveform information output from the plural signal waveform generating portions by summing so as to create and output the predetermined MTIE test signal.

12. An MTIE test signal generating apparatus according to claim 11, wherein the cycle-amplitude setting portion, the plural signal generating portions, the holding time setting portion and the synthesizing portion are constituted of a digital signal processor and the predetermined MTIE test signal is created and output by the digital signal processor.

13. An MTIE test signal generating apparatus according to claim 12, wherein as a phase modulator for modulating the clock signal from the reference clock generator in terms of phase with the predetermined MTIE test signal created and output by the digital signal processor, a direct digital synthesizer is employed.

14. A Maximum Time Interval Error (MTIE) test signal generating method in which a signal obtained by modulating a clock signal from a reference clock generator in terms of phase by means of a predetermined MTIE test signal is input to a maximum time interval error (MTIE) measuring unit including a low-pass filter having a predetermined high-cut characteristic at an input portion thereof so as to generate the predetermined MTIE test signal which enables measurement of a predetermined MTIE characteristic

based on the signal, comprising:

setting a cycle corresponding to an observation time of each of desired plural specific points for a predetermined MTIE characteristic of plural MTIE characteristics and an amplitude corresponding to a difference in the MTIE value between adjacent specific points of the desired plural specific points;

generating plural signals each having a cycle corresponding to an observation time of each of the desired plural specific points and an amplitude corresponding to a difference in MTIE value between adjacent specific points of the desired plural specific points and having repetitive waveforms in which after the signal amplitude increases from its lower limit value to its upper limit value during the each observation time, it decreases from the upper limit value to the lower limit value and then outputting to each of the desired plural specific points;

setting a holding time for holding the upper limit value and the lower limit value of the repetitive waveform of the signal over the predetermined time so that a signal cycle having at least the shortest cycle when the plural signals are generated is longer than a predetermined time corresponding to the predetermined high-cut characteristic of the low-pass measuring filter in the MTIE measuring unit; and

synthesizing the plural signals by summing and outputting as the predetermined MTIE test signal.

15. An MTIE test signal generating method according to claim 14, further comprising specifying the desired MTIE characteristic from the plural MTIE characteristics.

16. An MTIE test signal generating method according to claim 14, wherein setting of the holding time is executed by setting the holding time to a fixed value over the predetermined time when a signal having at least the shortest cycle is generated.

17. An MTIE test signal generating method according to claim 14, wherein setting of the holding time is executed by setting the holding time to any value over the predetermined time when a signal having at least the shortest cycle is generated.

18. An MTIE test signal generating method according to claim 14, wherein setting of the holding time is executed by setting the holding time corresponding to a cycle set at the time of setting the cycle when a signal having at least the shortest cycle is generated.

19. An MTIE test signal generating method according to claim 14, further comprising when a high-cut frequency for specifying the predetermined high-cut characteristic of the low-pass measuring filter of the MTIE measuring unit is changed, setting a high-cut frequency corresponding to the changed high-cut

frequency, wherein setting of the holding time is executed by setting the holding time corresponding to a high-cut frequency set by the high-cut frequency when a signal having at least the shortest cycle is generated.

20. An MTIE test signal generating method according to claim 14, wherein generation of the plural signals is to generate plural signals having substantially sine wave like trapezoidal waveform or substantially linear trapezoidal repetitive waveforms.